

REMARKS

Claims 1, 2, 4 and 6-20 are pending. By this Amendment, the specification, the abstract and claims 1, 2, 4 and 6-9 are amended, claims 3 and 5 are canceled without prejudice to or disclaimer of the subject matter contained therein, and claims 10-20 are added. No new matter has been added.

Paragraph [85] of the specification is amended to correct an informality. The Abstract is amended to be less than 150 words. Claims 1, 2, 4 and 6-9 are amended to clarify the claimed subject matter or to revise the dependency. Support for new claims 10-20 are found throughout the specification, the drawing figures, and the claims as originally filed.

For the following reasons, reconsideration is respectfully requested.

I. FORMAL MATTERS

A. Specification

On page 2, item 1 of the Office Action, the specification is objected to for containing an informality. Paragraph [85] of the specification is amended to obviate the objection. Withdrawal of the objection is respectfully requested.

On page 2, item 2 of the Office Action, the specification is objected to for the use of Trademark DMD. It is noted that the specification, at paragraph [4], supplies the generic terminology for the Trademark DMD, which is Digital Micromirror Device. Withdrawal of the objection is respectfully requested.

B. Claims

On page 3, item 3 of the Office Action, claims 2 and 5 are objected to for allegedly failing to further limit the subject matter of previous claims. Claim 2 is amended to obviate the objection. Claim 5 is canceled. Withdrawal of the objection is respectfully requested.

On page 3, item 4 of the Office Action, claims 1-9 are objected to for use of a Trademark in the claims. The generic term for DMD, which is Digital Micromirror Device is now used in claim 1 to obviate the objection. Withdrawal of the objection is respectfully requested.

On page 3, item 5 of the Office Action, claims 1-9 are objected to for use of terminology different from the accepted meaning. Claims 1, 2 and 6-9 are amended to recite an optical element, which is suggested by the Examiner. Withdrawal of the objection is respectfully requested.

II. REPLY TO REJECTIONS

A. 35 U.S.C. § 112, Second Paragraph

On page 5, item 7 of the Office Action, claims 1-9 are rejected under 35 U.S.C. § 112, second paragraph as allegedly indefinite. Claim 1 is amended to clarify the recited features and to obviate the rejection. Withdrawal of the objection is respectfully requested.

B. 35 U.S.C. § 102

On page 6, item 9 of the Office Action, claims 1-9 are rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 6,129,437 to Koga et al. (hereinafter “Koga”). The rejection of canceled claims 3 and 5 is moot. As to remaining claims, the rejection is respectfully traversed.

It is respectfully submitted that Koga fails to disclose or suggest a projection type display optical system, wherein the first lens and the optical element are set in such a manner that an optical axis of the optical element and an optical axis of the first lens are parallel but do not coincide with each other, whereby a surface image that is formed, when the emitted light ray from the rod lens is transmitted through the first lens and the optical element, is not inclined to the surface of the image display means, as recited in claim 1.

Koga discloses that the optical axis of the condenser lens and the optical axis of the spherical mirror are not parallel. Additionally, Koga is silent as to how the surface image is positioned with respect to a surface of the image display means.

More specifically, Fig. 1 of Koga discloses an image display apparatus using a digital micromirror device having an optical illumination module, a spherical mirror 2, a DMD 56 and a projection lens 57. The optical illumination module includes a white light arc lamp 51, a collector ellipsoidal mirror 52, a rotatable color filter 53, a rod lens 60, and a condenser lens 1 (see, for example, col. 5, lines 20-29, 39-42 and Fig. 1 of Koga). Koga discloses that the spherical mirror 2 is arranged to be “out of alignment” with the optical axis of the optical illumination module that includes the arc lamp 51, ellipsoidal mirror 52 and the condenser lens 1 (see, for example,

col. 5, lines 43-47 of Koga). Koga defines “out of alignment” as meaning that the normal of the spherical mirror 2 where the optical axis of the arc lamp 51, ellipsoidal mirror 52 and the condenser lens 1 intersects the reflecting surface of the spherical mirror 2 is inclined (see, for example, col. 5, lines 47-50 of Koga). In other words, as shown in Fig. 1 of Koga, the normal of the mirror 2 and the optical axis L1 do not coincide. Because of this reason, the optical axis of the mirror 2 and the optical axis L1 also are not parallel. For at least this first reason, claim 1 is patentable over Koga.

Further, because the normal of mirror 2 and the optical axis L1 do not coincide, the spherical mirror 2 and the DMD 56 are arranged such that the light beams reflected from the spherical mirror 2 enters the DMD 56 at a high angle, namely a small angle of incidence (see, for example, col. 5, lines 26-29 and Fig. 2 of Koga). As shown in Figs. 2 and 3 of Koga, the high angle between the spherical mirror 2 and the DMD 56 is achieved by placing the spherical mirror 2 very closely to the projection lens 57, but in a way that the optical axis of the spherical mirror 2 is not aligned with the optical axis L1 of the optical illumination module (that includes the arc lamp 51, ellipsoidal mirror 52, color filter 53 and the condenser lens 1). In other words, the spherical mirror is twisted from the axis L1.

The positioning of the spherical mirror 2 in a slightly twisted manner from the axis L1 in Koga is similar to the placement of the spherical mirror as discussed in related art embodiment of Fig. 4a of Applicant's specification as discussed in paragraph [37]. Such twisting arrangement of the spherical mirror 2 was discussed in Applicant's specification to be problematic, whereby

the twisting positioning of the spherical mirror 2 creates an inclined surface image or a keystone image on the DMD 56. For at least this second reason, claim 1 is also patentable over Koga.

Consequently, Koga fails to disclose or suggest that the optical axis of the optical element and the optical axis of the first lens are parallel but do not coincide with each other, and the surface image is not inclined to the surface of the image display means, as recited in claim 1, and claim 1 is patentable over the applied reference. Claims 2-9, which depend from claim 1, are likewise patentable over the applied reference for at least the reasons discussed above and for the additional features they recite.

For example, claims 2, 4 and 6-9 recites that the optical element is decentered with respect to the optical axis of the first lens. Koga, in contrast, shows that the circle mirror 2 has its center lying on the optical axis L1 of the lens 1 and, therefore, is centered. Thus, claim 2 is also patentable for this additional reason. Withdrawal of the rejection is respectfully requested.

III. NEW CLAIMS

Claims 10-20 are patentable over the applied reference. Prompt consideration and allowance are respectfully requested.

IV. CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance are

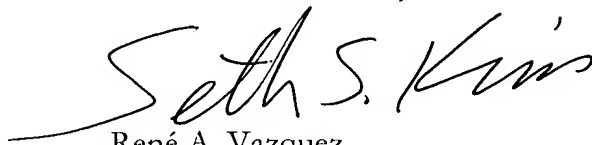
Serial No. 10/786,305
Reply to Office Action of April 4, 2005

Docket No. HI-0188

earnestly solicited. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **Seth S. Kim**, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
FLESHNER & KIM, LLP

A handwritten signature in black ink, appearing to read "Seth S. Kim", is written over the typed name.

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